Outline of AIST
--Integration for innovation--

Dr. Satoshi Hamakawa
Director, Planning Division,
Research & Innovation Promotion Headquarters,
AIST
AIST was established as an research institute after an integration of 16 research institutes etc. under the former Ministry of International Trade and Industry. AIST has six research fields in the institute to promote collaboration within a discipline and between disciplines.

1882

Geological Survey of Japan

April 2001 reorganized as an independent administrative institution

Research fields

Environment & Energy

Life Science & Biotechnology

Information Technology & Electronics

Nanotechnology, Materials & Manufacturing

Metrology & Measurement Science

Geological Survey & Applied Geoscience

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Organization Data

Established: 2001 (1882)
President, Head of the Organization: Dr. Ryoji Chubachi
Number of Research Institutes/Centers: 41 (21 Institutes, 20 Centers)

- Revenue 79.7 billion
- Subsidy 60.1 (75%)
- Commissioned research funds 11.2 (14%)
- Miscellaneous 7.6 (10%)
- Facility maintenance grants 0.8 (1%)

Initial Budget for FY 2012

- Life Science and Biotechnology 17%
- Information Technology and Electronics 17%
- Metrology and Measurement Science 16%
- Nanotechnology, Materials, and Manufacturing 15%
- Environment and Energy 25%
- Geological Survey and Applied Geoscience 10%
AIST Mission

To contribute to the realization of problem-solving country advocated by the Japanese government, AIST undertakes R&D focusing on major goals: solution for the 21st century issues and reinforcing functions of an open innovation hub.

Solution for the 21st century issues

○ Promotion of Green Technology
  Renewable energy, Energy saving, Safety assessment, etc.

○ Promotion of Life Technology
  Contribution to drug discovery and medical care, safety in life, etc.

○ Industrial infrastructure supporting safety and security
  Measurement standards, Measurement technologies, Geological information, etc.

Reinforcing functions of an open innovation hub

○ Developing new innovation system
  Promoting research / technology evaluation / standardization by furthering industry-academia-government partnerships and by utilizing its “human resources” and “platforms”.

○ Establishing open innovation centers
  Tsukuba Innovation Arena (TIA nano)
AIST contributes to product realization by open innovation

**Research and Development**

- **Academic results**
- **Valley of death**
- **Product realization**
- **Commercialization**

**Universities**

**Private enterprises**

**Basic exploratory research**

**“Full Research” of AIST**

- Conducting R&D to support and promote product realization and commercialization by private enterprises
- Technologies for mass production, systemerization
- Technologies to evaluate durability, reliability and safety
- Standardization

AIST has been conducting “Full Research” with the human resources and technological platform, where the research resources of universities and private enterprises are combined, innovation hub.
Mass-production technology of carbon nanotube

Basic exploratory research

- Discovery of novel nano carbon materials
  - Discovery of fullerene by Kroto, Smalley, Curl et. al. [1985]
  - Discovery of carbon nanotube by Sumio Iijima [1991]
  - the director of Nanotube Research Center (then at NEC Inc.)

〈〈Research on mass-production technology〉〉

- Discovery of Super-Growth method
  - Growth-rate increases by 1000-fold, opening the possibility of mass production for industry
  - Impurity is reduced to 1/2000.

- Continuous production equipment of carbon nanotube
  - Production capacity increases from 25g/day to 600g/day.
  - Accelerate application development by providing the kg order CNT samples

Introduction of commercial plant

10 ton/year production, exceeding present-day total production of the whole world

AIST

Universities

Private enterprises

"Full Research"
Open Innovation Model of AIST

New Innovation System with Human Resources and R&D Platforms

Human Resources

R&D Platforms

Creation of New Value by Academia-Industry-Government Collaboration

Oversea institutes

Universities (Oversea)

Public institutes, Local government

Enterprises

Oversea enterprises

Open Innovation Center
Enhancement of Open Innovation Hub

4 Major Activities to Function as an Open Innovation Hub

Creating R&D Cluster ➝ With Industry Cooperation and Global Network

Collaboration with Industry
➢ Collaboration with industry through “Full Research”.
➢ Conducting R&D to support and promote product realization.

Global Nanotechnology Center (TIA-nano)
➢ Implementing collaborative research with advanced facilities.
➢ Global researchers gathers “Under One Roof”

Fukushima Renewable Energy Research institute
➢ Promote collaborative R&D for renewable energy.
➢ New research center will open in 2014FY.

International Network
➢ Promote mutual joint research and global standardization with global partners.
➢ Creating global network toward the future.
Photovoltaic modules with thin crystal silicon wafer

Demonstration experiments of wind power generation

Production and utilization of hydrogen career

Geothermal utilization

Integrated energy management systems

Fukushima Renewable Energy Research Institute

AIST Tsukuba
AIST Tokyo waterfront
AIST Chubu
AIST Kansai
AIST Chugoku
AIST Tohoku
AIST Hokkaido
AIST Kyusyu
AIST Shikoku
Collaboration of Fukushima Institute

Reconstruction Agency “Program on Evaluating Technologies Invented by Industry in Tohoku Area”

Next-generation Crystalline Silicon PV Consortium involving 20 Companies

JST, MEXT Future PV Innovation “Si Nano-Wire Solar Cells”

Government-Academia-Industry Collaboration with Open Innovation Center

MEXT (Ministry of Education, Culture, Sports, Science and Technology Japan) “Regional Innovation Strategy Support Program Participation of Universities in Fukushima”

Europe
- SINTEF
- Fh.G

USA
- NREL

ASIA
- Thailand
- Indonesia
- Singapore

Fukushima Prefecture

Fukushima Renewable Energy Research Institute

SINTEF

Fh.G

NREL

ASIA

Thailand

Indonesia

Singapore

Next-generation Crystalline Silicon PV Consortium involving 20 Companies

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Government-Academia-Industry Collaboration with Open Innovation Center
Global Nanotechnology Center -TIA-nano

Mission of TIA-nano

- Nanotechnology research center to create new industries
- Installation of advanced facilities and equipments for open users
- Cultivation of next-generation leaders in nanotechnology fields

Various collaborations are formulated “Under One Roof” —

Collaborative Research

State-of-the-art Facilities

Win-Win Network

Education & Training

Event & Seminar

Cutting-Edge Technology
Open Innovation of TIA-nano

TIA-nano is enhancing open innovation with various projects and R&D partnerships

Founded: 2009
Leading Members: AIST, NIMS, KEK, University of Tsukuba
Projects: 26
Industrial Partners: 128

SiC single crystal
Carbon nanotube
300mm wafer of graphene

National Institute of Advanced Industrial Science and Technology
AIST

NIMS

筑波大学
University of Tsukuba
AIST Global Strategy

- Promotion of complementary and mutually beneficial joint research
- Promotion of international standardization
- Support of R&D activities in enterprises and their globalization

- R&D which leverage overseas research potential
- Support R&D activities of enterprises which leverage the AIST network
- Contribution to diplomatic mission
- International collaboration toward international standardization
Examples of International Collaborative Research

- BPPT, LIPI, GAI (Indonesia)
  Improvement in natural rubber production, Metrology, Renewable Energy

- CNRS (France)
  Robotics

- Fraunhofer (German)
  Macromolecule actuator

- DBT (India)
  Searching for anti-cancer chemicals

- NREL etc. (US)
  Renewable Energy

- SJTU (China)
  Liver cancer marker

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- VAST (Vietnam)
  Water purification

- NSTDA, TISTR, NIMT (Thailand)
  Bio-diesel Fuel, Metrology

- Joint laboratory

  - CNRS (France)
  - Fraunhofer (German)
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